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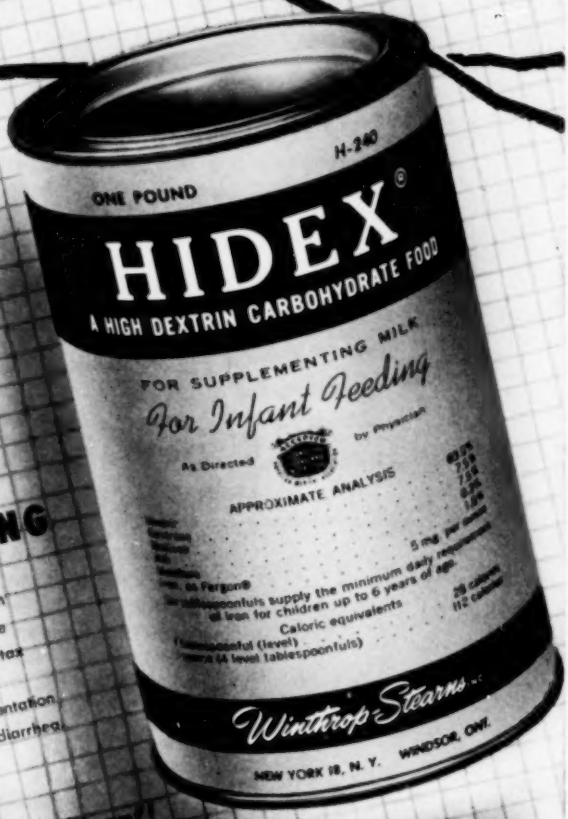


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Since 1825



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# IN MEMORIAM

## FREEMAN P. STROUP*

"MR. CHIPS"—our beloved "Mr. Chips" has gone home—for good. Freeman Preston Stroup is asleep in the Lord—the Lord in whose service he had given all that he had—through all of his life. Thousands of his "children" will mourn him—and yet each of them will be glad to know that he walked through the valley of the shadow of death with peace in his heart and by the kindness of his Maker, for all we know, free of the heavy hand of pain. God gave him his beloved sleep. And if anyone was entitled to so mellow and sweet a sublimation in death, it was Stroup—Professor Stroup.

I went to his funeral, in the oil country where he was born, a rustic, reverent little spot called Rouseville. His people were there—relatives and friends—quiet, persevering, plain, God-fearing, God-serving people, anchoring people who give the lie to sham and hypocrisy—as Stroup did—people who are the earnest, the certain herald of the America that must persist, the quiet determined people, who, as Stroup did, go about their way doing good,—doing it not ostentatiously and obtrusively—but quietly, naturally, humbly.

With his sister, all that is left of the immediate family, I visited the little house where he was born, and I felt positive that none had issued from that terrain, Rouseville, Oil City, Titusville, Franklin—all famous for their pioneering in Pennsylvania petroleum—none had come out of that country who had been such a benevolent, beneficent influence on so many people as had been our blessed Professor Stroup.

Yes, certainly, millionaires in oil, present and absentee exploiters in oil, had made names and fortunes for themselves locally and elsewhere, but here was one, now dead, yet whose whole life had been dedicated, invested and consecrated, not to the dross and the selfish, but rather to improving the caliber and character of thousands of young people in his church and in his college, impressing them with

* Memorial Statement given by Ivor Griffith, President Philadelphia College of Pharmacy and Science at the Alumni Dinner held at the Union League, Philadelphia, August 19, 1952, during the Centennial Convention of the A. Ph. A.

an understanding of the values that endure—the things that last, the insoluble residues which are the gold and silver chalices, the vestments, the sacramental glories that engage the gaze of the angels and procure the approval of Jehovah himself.

Freeman Preston Stroup had served as a teacher and as the Alumni catalyst at the Philadelphia College of Pharmacy and Science for over a half a century.

He could spot an alumnus of the college in any assembly—he knew their names, their vocations, their avocations—and their locations. He had a memory and a system for buttressing that memory, seldom seen even in college professors.

He loved young people—as an artist loves his pigments, and as the sculptor delights in the unchiselled rock—for he knew their potentials for beauty and for service—and he loved to watch them develop into those satisfying entities that titillated his pride and justified his confidence in them.

He lived to teach many grandchildren of his early pupils—and one of his first self-imposed assignments when came the day of registration of students in the Fall was to be ready with his handclasp and heartclasp to welcome all—but particularly the sons and daughters of his beloved Alumni. I can still feel the warmth of his caressing arm over my shoulders, when homesick and lonesome, I came to the old college to register, a long 43 years ago.

Simple in his tastes, thrifty in his living—he was prodigal with his affections and proof of his loyalty to his Alma Mater rests in the fact that he left his entire estate for the good of the College which he had served so well for over half a century.

As a teacher and friend he will be long remembered, and all who sat in his classes and had the privilege of his friendship will join in this testimony.

He taught—and he sought
For his ultimate objective
Not with formulas collective
Not with ritual pedagogic
Nor with regimented logic
He disliked mundane statistics
And those lecture hall ballistics
He believed in education
Stressing character formation

And pursued these pleasant by-ways
Far removed from charted highways
Paths of beauty in the valleys
Lanes of duty in the alleys
He would learn as well as teach
He would pray as well as preach
And he made a happy landing
Safer far than those outstanding
Exhibitionists of "teach"
For his boys, grown men, could say
He taught us how to watch and pray
And live rejoicing every day
Happy day—Oh happy day
When teachers all shall teach that way.

# E D I T O R I A L

## TEACHERS AND HUMANITY

THIS issue of our Journal is dedicated to Dr. Freeman P. Stroup, who served American pharmacy and the Philadelphia College of Pharmacy and Science for over half a century. Our cover carries his photograph, and immediately preceding this editorial is a memorial written by Dr. Ivor Griffith who was one of Professor Stroup's "boys", as he often called his former students.

Professor Stroup, prior to his death, had the distinction of having taught more pharmacists than any living person; he numbered his former students in the thousands. Most of these he still knew by name and could recognize at a glance, even when he had not seen them for years. Few teachers, indeed, have that personal and intimate feeling for their students to which Professor Stroup's memory gave proof.

We could devote a series of editorials on this one man and his quiet, untiring service to his students over the years, but we feel an editorial about the contribution made by all true teachers would be the type of thing which would please Dr. Stroup most were it possible to consult him.

Great teachers are the source of all our moral, religious, social, and scientific advance and, indeed, without them, we would be still only a few steps above our early ancestors who sought little else than physical comfort and momentary security. Each religious faith stems from some great teacher who tried to guide men into a new life and one with fuller meaning. Every scientific advance was made because some teacher led some young mind to think, challenge, and create rather than accept things as they were.

Time was when teachers were revered and respected, for it was realized that in them rested the hope for a brighter future with peace and good will toward men. This respect came from all strata of society, rich and poor alike, and it was founded on a code of human values based on a belief of the dignity of man and divine guidance in the affairs of men. This writer remembers well when, as a boy, it was the custom to tip one's hat at the village school principal. This

teacher was the only male in town accorded this respect, with the exception of the clergy.

History reminds us that great teachers of the past were given such recognition that they could, and often did, defy kings and potentates with impunity. What a change, today, in our materialistic society! In many places, public school teachers find it most dangerous to oppose in the slightest the most brutish "ward-heel", regardless of how unwarranted his demands. Even some college teachers are now threatened with expulsion unless they sign some "loyalty oath" which, in essence, is an endorsement of the *status quo* and a warning against the dangerous practice of freedom of thought and expression.

Schools, only too often, are guided and even directed in their policies not by educators but by politicians or "successful" businessmen. We then express surprise and concern that American education is rapidly becoming a training for survival in commerce or combat; rather than the development of wisdom and understanding. The measure of a school's success by many is the earnings of its graduates, and the dollar is the common denominator for all achievement.

Fortunately, there are still schools and still teachers wherein and in whom the philosophy of true education may still be found. Their light is like that shining in a wilderness, and it shall not be extinguished. Here men and women toil, often unsung and unpraised, to carry on their mission, regardless of opposition and the scorn of others. Only they and those, who as their disciples will someday succeed them, understand why it is worth doing, for it shall surely bring no great material reward.

The time will come when we shall have pursued that elusive and chimerical happiness and success offered by those who preach the doctrine of materialism to its bitter and terrible end. Then will those who now are the meek "inherit the earth"—to pick up the pieces that are left and build again a human society based on the true values of life.

We have all known such teachers and been proud to be their students and friends. Such a man was Stroup who sought not earthly praise and reward, but built for himself a treasure in heaven and a place in the hearts of his "boys" forever.

L. F. Tice

# PRODUCTION OF BUCKWHEAT LEAF MEALS WITH HIGH RUTIN CONTENT

By J. Naghski, B. A. Brice and C. F. Krewson *

IN recent years, buckwheat has been displaced as a domestic source of rutin by the dried flower buds of the Chinese Scholar tree (*Sophora japonica*) (4), imported from China. This situation occurred mainly because the dried buckwheat meals available commercially were whole-plant meals of low rutin content (2 to 3%), which could not compete with the Sophora, which contained from 12 to 16% rutin. The embargo on trade with China has cut off supplies of Sophora, and drug manufacturers are greatly in need of new sources of material for rutin. To supplement their depleting stocks of Sophora, some manufacturers have started to import Eucalyptus leaves from Australia, which contain from 6 to 12% rutin. Eucalyptus, however, not only has the disadvantage of being an imported material but at present it is also undoubtedly the surplus from the needs of the United Kingdom, and shortages may develop as their demand for rutin increases.

Thus it is evident that an improved domestic source of rutin is highly desirable. Discussions with some of the rutin producers have revealed the following information: (1) they appear desirous of a dependable domestic source of raw materials; (2) they state that a domestic product containing 5 to 8% of rutin, if a dependable supply was available, would compete successfully with Sophora or Eucalyptus at their present market prices; and (3) they state that the available supplies of Sophora and Eucalyptus are just enough for the present demand for rutin but would be insufficient if the demand were to rise sharply.

Results of recent studies indicate that buckwheat can be produced that would meet these requirements. Buckwheat leaf meals containing more than 5% rutin, which have not heretofore been available commercially, have been prepared on a pilot plant scale (10)**. To do this commercially, however, will require some modification of the

* Eastern Regional Research Laboratory, Philadelphia 18, Pennsylvania, one of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, United States Department of Agriculture.

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present commercial drying procedures and more careful attention to growing conditions and maturity of the buckwheat.

It is the purpose of the present publication to review and emphasize the factors contributing to high rutin content of buckwheat and leaf meals; to point out that all the available knowledge on this subject has not been applied commercially, and to suggest means of further increasing the rutin content of this domestic material.

## Preparation of Dried Buckwheat Leaf Meal

Rutin can be extracted from either the fresh green immature plant or from a meal prepared by drying and grinding the green plant (8). Fresh plants have the disadvantage of being available only during the limited growing season, whereas the dried product can be stored for year-round production. Early work (3) showed, however, that buckwheat had to be dried carefully to prevent excessive destruction of the rutin.

*Fractional Drying:* The finding that the major portion of the rutin was located in the leaves and blossoms of the immature buckwheat (3) suggested that rutin could be concentrated by the preparation of a leaf meal. Eskew and co-workers worked out in detail a procedure for producing a dried leaf meal, using either a belt (6, 7)* or a direct fired rotary drier (10)*.

The recommended procedure is to dry as quickly as possible and carry the drying only far enough to embrittle the leaves and flowers; the stems, being much thicker, remain moist and tough. The plants in this condition are subjected to mechanical action, which breaks the brittle leaves and flowers away from the stems and crushes them into fragments. This is accomplished by directing the fractionally dried buckwheat into a fan, which, acting somewhat as a hammer mill, strips the friable leaves from the limp stems. The fan also blows the material to a cyclone collector. From there it falls to a vibrating screen, which separates the stems from the leaf fragments. A bag filter is provided on the cyclone exhaust to recover rutin-rich fines.

The drying process has to be carried out under strictly controlled conditions to prevent excessive loss of rutin. Even under optimum conditions for fractional drying, 25 to 35% of the rutin is lost; if the buckwheat is totally dried, the destruction is somewhat greater. The

* Copies of "processed" publications can be obtained by writing to the Eastern Regional Research Laboratory, Philadelphia 18, Pennsylvania.

degree of rutin destruction depends on the type of drier, the temperature and the variety of buckwheat used.

Although it is possible to hand-pick a leaf and blossom fraction which would have almost 80% rutin enrichment (9), this separation has not been done mechanically on a commercial scale. An evaluation of a number of leaf meals produced at this laboratory during the pilot plant study of drying conditions (Table I) showed that a 50% concentration of rutin could be produced over that which could be obtained when whole meals were prepared. This enrichment was more than enough to compensate for losses encountered during drying, and the leaf meals were richer in rutin than the starting fresh plant (9). Since in these studies only 60% of the stem material was discarded, there is a possibility that removing a greater proportion of the stems (10) would produce even greater concentration.

Field drying as an adjunct to artificial drying has been investigated (9, 10). Under favorable conditions as much as one-third of the water could be removed from normal buckwheat or one-half from unusually lush buckwheat without reducing the over-all recovery of rutin, provided that wilting was not carried far enough to reduce the moisture content below 78%. Wilting greatly increases the capacity of the drier and decreases the cost of fuel. Under unfavorable weather conditions when wilting was slow, however, an appreciable loss of rutin occurred.

*Relation of Buckwheat Variety to Rutin Content:* Buckwheat first used for production of rutin was the Japanese (*Fagopyrum esculentum*) (3), commonly grown for grain. Later work (5), however, showed that the little-known Tartary (*F. tataricum*) was superior in several respects. It was 45 to 80% richer in rutin, had a higher proportion of leaf, and yielded greater quantities of leaf per acre. Furthermore, Tartary is more frost resistant and so can be planted earlier in the spring. In addition to these cultural advantages, Tartary buckwheat is better suited for dehydrating. It can be dried at higher temperatures and with less critical control than the Japanese (7). Work with three additional varieties of buckwheat—Silver Hull, Tartary Tetraploid (11) and Emarginatum—indicated that, for rutin production, Tartary is also better than the Silver Hull and Emarginatum (12, 13). The Tartary Tetraploid (13) is similar to the Tartary in rutin content and yields and so has potentialities for rutin production; however, seed is not available in commercial quantities.

TABLE I.—RUTIN CONTENT OF LEAF MEAL PRODUCED BY FRACTIONAL AND TOTAL DRYING OF TARTARY BUCKWHEAT PLANTS [a]

(Moisture-free Basis)

| Sample No. | Corrected Values for Rutin in Fresh Plant (A), % | Leaf Meal (B), % | Whole Meal [b] (C), % | Increased Concn. of Rutin in Leaf Meal,[c] % |
|---|---|---|---|---|
| 1 | 4.64 | 4.89 | 3.19 | 53 |
| 2 | 5.22 | 5.38 | 3.50 | 54 |
| 3 | 3.97 | 3.26 | 2.16 | 51 |
| 4 | 4.49 | 4.74 | 3.10 | 53 |
| 5 | 3.49 | 3.53 | 2.33 | 52 |
| | Totally Dried | | | |
| 6 | 3.89 | 3.46 | 2.29 | 51 |
| 7 | 4.81 | 4.03 | 2.65 | 52 |
| 8 | 2.89 | 1.73 | 1.20 | 44 |
| 9 | 3.28 | 3.15 | 2.09 | 51 |

[a] Samples obtained during the investigations on buckwheat drying by Phillips et al. (10).

[b] Calculated on the basis of discarding 37% of the dry weight as stems containing 0.3% rutin.

[c] $\frac{B - C}{C} \times 100$.

*Effect of Age of Plant and Time of Planting on Rutin Content:* Figure 1 shows the effects of age and time of planting on the rutin content of Tartary and Japanese buckwheat. It can be seen that buckwheat plants reach the peak of rutin content at the time of blooming which is about 25 to 35 days after emergence, depending on the species. The rutin content of all buckwheat decreases after seeds form. The decrease in rutin content of Tartary buckwheat is not so rapid or so great as that of the Japanese. Tartary both flowers and sets a full crop of seed more slowly. It does not mature so rapidly but grows continuously, maintaining a considerable portion of the plant as young immature tissue, which is always richer in rutin.

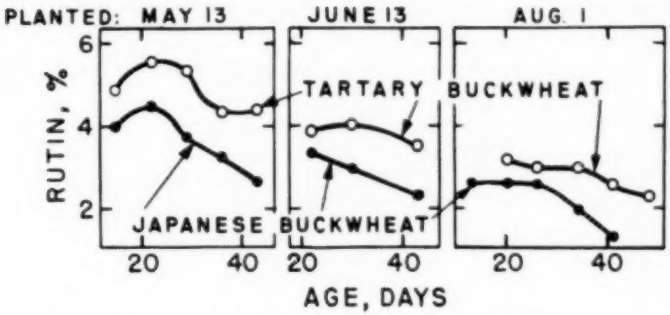


FIGURE I. Effects of Age of Plant and Time of Planting on the Rutin Contents of Japanese and Tartary Buckwheats. (Grown at Lancaster County Tobacco Experiment Station, 1946).

Buckwheat is ordinarily seeded for grain production in late June or early July. Good yields of rutin were obtained in Pennsylvania by seeding on May 13 (Fig. I); the rate of growth was slower in early plantings but the percentage of rutin was higher. Seeding on June 13 and August 1 gave larger plants, but the percentage of rutin was progressively lower.

In 1948, four large-scale plantings of Tartary buckwheat were made on Lansdale silt loam, Montgomery County, Pennsylvania, to supply material for drying studies with a portable alfalfa drier (10). Figure II shows the rutin content of buckwheat harvested from these four plantings. Here again the buckwheat from the earliest plantings had the highest rutin content, and the rutin decreased progressively as the season progressed. Since in most cases the rutin content of leaf meals prepared by fractional drying is only slightly higher than that of the fresh plant, (Table I) to produce leaf meal of high rutin content, Tartary buckwheat must be harvested at the peak of its rutin content. The best time will vary with the season, but it will be about 4 to 6 weeks after seeding.

It is doubtful that a buckwheat meal sufficiently rich in rutin could be produced from buckwheat planted later than June. The date of planting will depend somewhat on the geographic location. Where the climate is cooler and growth is slower, planting may be delayed somewhat. Table II shows that Tartary buckwheat grown in experimental plots located in Clearfield County and Susquehanna County produced plants with 5.0 to 5.6% rutin when planted in June. Plants

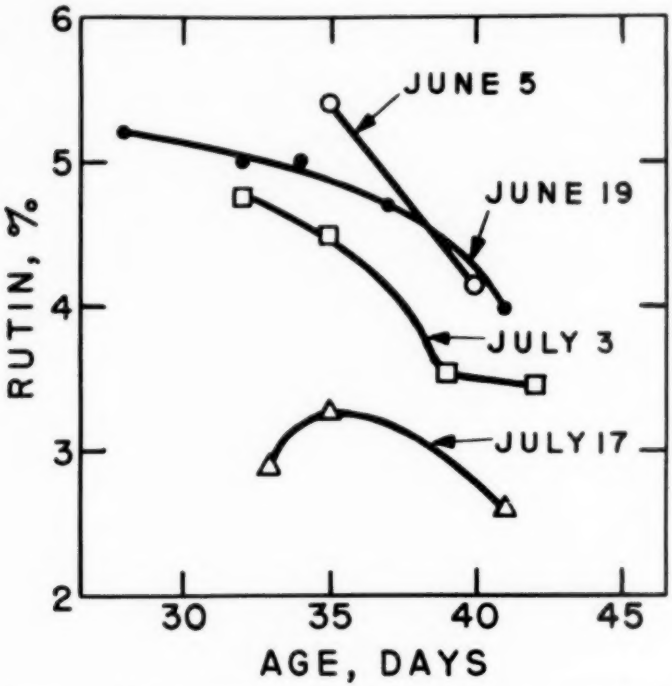


FIGURE II. Effect of Date of Planting on Rutin Content of Tartary Buckwheat.

grown on plots in Montgomery County had a slightly lower rutin content. This may have been due in part to the warmer climate. It has been reported by others (1, 2) that the flavonol content of plants increases with altitude. Additional work must be done to determine the full effect of climatic and agronomic conditions. Another reason for the lower rutin content is the greater fertility of the Lansdale silt loam, which produced plants with greater proportion of stem to leaf.

*Effect of Fertilization on the Rutin Content of Buckwheat Plants:* Experiments to evaluate the requirements of the major fertilizing elements—nitrogen, phosphorus and potassium—were carried out by the Pennsylvania Agricultural Experiment Station and the Department of Agriculture (13). On the better soils, phosphorus was the only fertilizer necessary to produce good growth of the buckwheat plants; on less fertile soils, nitrogen was also needed for adequate growth.

TABLE II

YIELDS OF RUTIN, STEMS AND LEAVES BY TARTARY BUCKWHEAT ON DEKALB, VOLUSIA AND LANSDALE SILT LOAM

| | Dekalb Silt Loam Clearfield County [1] | | | Volusia Silt Loom Susquehanna County [1] | | Lansdale Silt Loom Montgomery County [2] | | | |
|---|---|---|---|---|---|---|---|---|---|
| Age, days | 41 | 54 | 66 | 49 | 62 | 34 | 40 | 50 | 55 |
| Moisture, % | 88.3 | 83.9 | 78.2 | 87.3 | 80.5 | 86.7 | 84.1 | 78.8 | 76.5 |
| Rutin, % (m.f.b.) | 5.6 | 5.0 | 3.4 | 5.0 | 3.4 | 4.6 | 4.5 | 3.4 | 3.0 |
| Rutin, lbs. per acre | 56 | 188 | 196 | 141 | 231 | 188 | 248 | 238 | 220 |
| Stems, lbs. per acre (dry weight) | 400 | 2450 | 4590 | — | 5260 | — | 3620 | — | 5570 |
| Leaves, lbs. per acre (dry weight) | 600 | 1300 | 1180 | — | 1520 | — | 1930 | — | 1740 |
| Leaves, % whole plant | 60 | 35 | 21 | — | 22 | — | 35 | — | 24 |

1 Buckwheat planted in June 1947 (5).

2 Buckwheat planted in June 1948; average of the two nitrogen treatments; plants one inch apart in row (13).

In none of the experiments did fertilization increase the percentage of rutin in the plant.

Other factors not yet evaluated in connection with improving the rutin content of buckwheat include the proper balance of trace elements, altitude and soil conditioners.

### Possibility of Separating Leaves from the Fresh Plant

In all large-scale studies on the rutin content of buckwheat plants, the leaves have been separated by fractionally drying. This process results in a 25 to 35% loss of rutin. This loss could be avoided if the rutin were extracted from the fresh plant. To decrease bulk, however, it would be preferable to separate and extract only the leaves. No information is available on the feasibility of separating the leaves from the fresh plant. It seems practical, however, that a process could be developed for utilizing air elutriation, such as is used to fractionate other materials of different densities. It should be possible to detach the leaves from the stems by the simple expedient of cutting the plants into one- to two-inch lengths in a forage chopper, as has been done in the past in harvesting the buckwheat preparatory to drying. Air elutriation should separate this chopped material into a leaf fraction and a stem fraction. This type of separation should have advantages not only for extraction of fresh material but also for the drying process. The reduction in bulk would increase the capacity of the driers from 2 to 3 times. Moreover, it would produce significant saving in fuel costs by reducing the amount of water removed. For even under the optimum conditions of fractional drying, the stems are dried to 25 to 35% moisture, which means that about three-fourths of the water contained in the stems is removed.

Furthermore, because the leaves contain less moisture than the stems, (9) a leaf fraction would have a high content of dry matter. This would further increase drier output. Since the wet stems in the drier retard the drying of the leaves, the rate of through-put in drying would be considerably greater for a leaf fraction, and possibly lower temperatures could be used effectively. Whether this would reduce loss of rutin can be determined only by further study.

The greatest advantage of producing a fresh leaf fraction is the concentration of rutin that can be effected. In a previous publication (9) we showed that by stripping the leaves by hand from buckwheat plants containing only 3.6 to 4.3% rutin, a leaf fraction having 6.3

to 6.4% rutin could be produced. This means that the rutin content was about 50 to 80% more than that of the whole plant. Assuming that the same enrichment could be realized with buckwheat containing 5.0 to 5.6% rutin (Table II), the expected rutin content of the fresh leaf fraction would be 7.5 to 10%. Such material would definitely hold promise as a commercial source of rutin. Unfortunately, emphasis in previous studies was placed on obtaining maximum yield of dry matter per acre, and no data were obtained on the rutin content of the leaf fraction.

Whether buckwheat may be capable of staging a comeback will most likely depend on such factors as: (1) the possibility of producing buckwheat plants that consistently contain 5% or more of rutin, (2) the feasibility of separating the leaves from the stems in the fresh state, (3) climatic and agronomic conditions that will increase the rutin content of the buckwheat plant and (4) increasing the rutin content either by selection or breeding of buckwheat.

The data and speculations presented here indicate that buckwheat is a potentially satisfactory commercial source of rutin in the United States. It is suggested that manufacturers of rutin seriously re-evaluate this readily available source, and attempt to assist in the preparation of a better raw material to be produced in accordance with their needs.

## Summary

Buckwheat leaf meals can be produced with sufficiently high rutin content to compete favorably with imported rutin-bearing plant materials. To obtain plants containing a high percentage of rutin, tartary buckwheat should be planted early in the season and harvested in the blooming stage. Fractional drying enables concentration of the leaf and blossom fraction, which contains most of the rutin.

Development of a process for mechanical separation of the leaves from the stems of buckwheat in the fresh state is suggested as an immediate possibility for preparing a product with an exceptionally high rutin content. Other factors not yet evaluated in connection with increasing the rutin content of buckwheat include proper balance of trace element nutrients, the altitude at which the plants are grown, and soil conditioners.

## REFERENCES

(1) Bancroft, W. D., *Jour. Phys. and Colloid Chem., 51,* 1078-1087, 1947.

(2) Couch, J. F., *J. Am. Chem. Soc., 70,* 256-257, 1948.

(3) Couch, J. F., Naghski, J., and Krewson, C. F., *Science, 103,* 197-198, 1946.

(4) Couch, J. F., Naghski, J., and Krewson, C. F., *J. Am. Chem. Soc., 74,* 424-425, 1952.

(5) Couch, J. F., Naghski, J., White, J. W., Taylor, J. W., Sando, W. J. and Street, O. E. "Tartary Buckwheat as a Source of Rutin," *U. S. Dept. Agr., Bur. Agr. and Ind. Chem. AIC-222* (Eastern Regional Research Laboratory) February 1949. (Processed.)

(6) Eskew, R. K., Phillips, G. W. M., Griffin, E. L., Jr., and Edwards, P. W., "Production of Rutin from Buckwheat Leaf Meal," *U. S. Dept. Agr., Bur. Agr. and Ind. Chem. AIC-114* (Eastern Regional Research Laboratory) April 1946. (Processed.)

(7) Eskew, R. K., Phillips, G. W. M., Griffin, E. L., Jr., Shaines, A. and Aceto, N. C., "Production of Rutin from Buckwheat Leaf Meal," *U. S. Dept. Agr., Bur. Agr. and Ind. Chem. AIC-114, Rev. 1* (Eastern Regional Research Laboratory) June 1948. (Processed.)

(8) Krewson, C. F. and Couch, J. F., *J. Am. Pharm. Assoc., Sci. Ed., 39,* 163-169, 1950.

(9) Naghski, J., Krewson, C. F., Porter, W. L., and Couch, J. F., *J. Am. Pharm. Assoc., Sci. Ed., 39,* 696-698, 1950.

(10) Phillips, G. W. M., Aceto, N. C., Eskew, R. K., and Hurley, Rita, "Production of Buckwheat Leaf Meal in Rotary Alfalfa Driers," *U. S. Dept. Agr., Bur. Agr. and Ind. Chem., AIC-264* (Eastern Regional Research Laboratory) March 1950. (Processed.)

(11) Sando, W. J., *Hered., 30,* 271-272.

(12) Taylor, J. W., and White, J. W., *Yearbook of Agriculture,* p. 751-752, 1950-51.

(13) White, J. W., Naghski, J., Couch, J. F., Holben, F. J., Washko, J. B., Taylor, J. W., and Sando, W. J., "Influence of Agronomic Factors on the Rutin Content of Buckwheat," *U. S. Dept. Agr. Tech. Bull.* In preparation.

# HAS PROFESSIONALISM IN PHARMACY DEVELOPED IN THE LAST CENTURY? *

By Edward J. Yorke

THIS is the 100th Anniversary of the American Pharmaceutical Association, and I have been asked to discuss whether during the last century pharmacy has or has not developed in professionalism.

This is, without doubt, a difficult subject to discuss, since the last 100 years has seen so many changes in pharmacy that, today, it is totally unrecognizable compared to what it was in 1852.

From a copy of the Code of Ethics, established by the American Pharmaceutical Association in 1852, we find pharmacy divided into two components: the apothecary, whose professional skill was devoted to the compounding of prescriptions, and the druggist, who was a miller of drugs and supplier of chemicals for the apothecary.

Today, we have the original apothecary, subdivided into apothecaries, merchandisers, and establishments wherein non-drug items and lunches, far outweigh the volume of true drug store items.

In today's presentment of the "Druggist of 1852", we have reputable drug manufacturers, those manufacturers who are attempting to become reputable, and the manufacturer of substitutes.

From this conglomerated mass we are to separate the professional from the non-professional, and weigh the balance.

Before entering into this discourse, I believe, we should establish what we mean by professionalism:

According to Webster professionalism means "the following of an ART."

Since 1852, two new categories of pharmacy have been added, and with your permission, I would like to discuss these segments before entering into the primary comparison.

Hospital Pharmacy is a new development since 1852 and we must divide those pharmacists in this classification into two groups. Some hospital pharmacists have a definite air of professionalism, because they still reserve the right to manufacture some of their own medications: intravenous products, injectables, disinfectants, soap, tinctures

* Presented at a Panel Discussion before the Practical Pharmacy Section of the American Pharmaceutical Association, Aug. 20, 1952.

and elixirs. This type of hospital pharmacist is definitely "following an art", and because of his pharmaceutical ingenuity, you will find numerous instances where he occupies a position on the Board of Directors, where his opinion on pharmaceutical decisions is highly respected.

On the other hand, we have the hospital pharmacist who allows himself to be placed in competition with retail pharmacists, and because of freedom from taxes, lower initial cost of merchandise and, in some instances, no labor overhead, offers unfair competition to tax-paying, community-supporting pharmacists.

Another new distinction in pharmacy, is the present-day wholesaler, who because of his stock and service, adds considerable by allowing an appreciable number of pharmacists to operate with a reduced inventory, and a higher ratio of turnover.

Credit is also due pharmaceutical educators for the remarkable strides in education that have been made in the last hundred years. Graduates today are better prepared to "follow an art" than at any time in the history of our profession.

Now to return to our original breakdown of the apothecary and the druggist of 1852.

Today, about 10 per cent of the retail pharmacists in America practice pharmacy as it was in 1852, compounding prescriptions and offering for sale, only items for cleanliness and the sick room. These gentlemen are endeavoring to "follow an art" and are to be commended.

In our present-day category of merchandisers, we have about 60% of all retail outlets, who, with a little more effort on decisions of how to increase their professional service, and more analysis of the futility of unprofitable sidelines, could become apothecaries and reduce the criticism and derision accorded our chosen profession. To substantiate this opinion allow me to relate a series of incidents that followed the opening of my own establishment. Eight years ago I opened a pharmacy dedicated to "following an art", in a community of 12,000 population, where four other outlets were already established—one with a fifty-year reputation, one with 15 years' existence, a well-known chain store and a Rexall outlet. Our pharmacy was located a full square from the business hub, and directly across from the local fire house where parking was prohibited. Within six months, the leading pharmacist moved his store, and when he did, his prescription department was given more prominence. The fifteen-year inhabitant, within

two years of our beginning, remodeled his store and abolished his fountain. Another elderly man located three miles from us, on his first visit to our place remarked "this has been my life's ambition". Two years ago he re-established his business and didn't take his fountain with him.

In all of the instances recited, the participants named have increased their volume and are without regrets for their decision. Another gentleman, whom I know, abolished his fountain and when questioned about the reaction replied "Why didn't I do it thirty years ago?". These examples will, I believe, substantiate my opinion that more of us can "follow an art".

In the segment referred to as sellers of non-drug store items and lunches (about 20% of the total outlets) I believe it would be more profitable for these gentlemen to develop the prominent part of their business and divorce themselves from the expensive investment and long hours of pharmacy.

So far we have accounted for 90 per cent of all pharmacy retail outlets, the remaining ten per cent, I regret are the hopeless, frustrated individuals who would be better off declaring bankruptcy, before all is lost. If you are honest, I believe you will agree that retail pharmacy in its avoidance of "following an art", in order to merchandise has not added very much professionalism to pharmacy.

In the subdivision of manufacturers, we analyze first, the reputable manufacturer, who through profitable returns on his investments, is capable of reinvesting his profits in new scientific investigations. These have provided the physicians and public with the greatest armamentarium of agents to cure and control disease ever known to mankind. They are indeed in the front line of mankind's war against disease, sickness and death—and are a credit to pharmacy.

Being businessmen as well as professional men, they realize that every venture must be profitable in order to be successful. Unfortunately, some of their professional glamour is beginning to tarnish because of their disregard of ethics. Duplication of competitor's products is reducing their esteem, and their attempts to prove that a registered pharmacist is not capable of adding some phenobarbital or additional penicillin to a prepared liquid is not winning any new friends for them. They can undo all their accomplishments by continuing to establish retail prices on their products, without just consideration of the business costs and investments of their outlets. Being businessmen, they must carry their philosophy on profits into their dealings

with others, for what is good for one is surely good for the other, particularly when the profitable success of new products is so dependent upon proper distribution and availability in time of need for these new products.

In describing the manufacturer who is attempting to become reputable, we can only say, that because of lack of volume and insufficient finances, he must cut some corners in the hope of increasing his sales to the profitable point, where corners will not have to be shaved and he can profess reputability.

The final segment of this category, the manufacturer of substitutes, has added nothing but disgrace to the pharmaceutical family. His success is based on his perverted ability to mimic the established, profitable products of men, who through costly investigation, expensive clinical trial, and laborious promotion instituted preparations that resulted in an assistance to man's well being, with a deserving profit to the discoverer. These imitators, do *no* investigating, their products are *not* clinically proven, and their income is *not* used for other worthwhile experiments. I personally believe, that if more pharmacists had a stronger moral concept concerning this group and their products, the life of the substitutor and his offspring would be short-lived.

In 1852, we had only the American Pharmaceutical Association as evidence of organized pharmacy. Today, pharmacy is the most disorganized of professions. It is not because of lack of associations, but because of the need for a united national association, free of personalities, with a firm understanding of the needs of pharmacy, and a relentless desire to procure these needs. If I might digress momentarily, I ask you to create a mental picture of the power that we as dues paying pharmacists represent. Consider if you will, 55,000 store owners paying $5.00 county dues, $10.00 state dues, and $10.00 each to the two National Organizations. Individually, this represents a payment of $35.00, but collectively it amounts to $1,925,000.

Don't misunderstand me, gentlemen, I'm not opposed to organized pharmacy, but I am opposed to multiple, disorganized factors that do not guarantee us the right "to pursue an art" by not being strong enough to oppose those who would destroy us.

Professionalism in pharmacy will be more developed, when all segments of the profession become more aware of the fact that we cannot exist individually; but by being collective, we can present a united front that will demand the respect and admiration of the popu-

lace and place pharmacy back on its rightful pedestal among the other professions.

In a discussion of this type, it is regrettable, that, because of time limitations, we must deal in generalities, for in every category mentioned, we do have some good as well as some bad. Personally, I know some questionable apothecaries as well as some highly reputable owners of merchandising stores. However, we can only endeavor to project the over-all picture, and in doing that some who are guiltless are considered guilty, and vice versa.

In conclusion, professionalism in pharmacy has developed, but in our projection of this on the public, we have not placed our best foot forward.

# MEDICATION TECHNIC AND THE GRADUATE MEDICAL STUDENT *

By Aaron Lichtin **

AT the 1937 meeting of this Association in New York City, before the subsection on Hospital Pharmacy, I presented a paper entitled "The Hospital Intern and Drug Therapy" in which I reported my experience with a series of lectures in Applied Drug Therapy which I helped to develop. In that paper I stated:

"The physician is acquainted with the action of drugs but his knowledge of how to use and prescribe them is rather fragmentary. Physicians when properly approached by one who is familiar with the general subject of drug therapy and prescribing, are receptive to ideas which would improve their knowledge of Materia Medica and help them make their treatment of disease more effective. In this situation, an opportunity exists for pharmacy to be of real service to medicine. The busy practitioner is more or less set in his accustomed ways of prescribing drugs; but the medical intern, eager to learn as much as possible about his chosen profession and having the idealistic viewpoint toward his calling, the practice of which he is just about to begin, makes the fitting student to whom to teach rational drug therapy under the most appropriate conditions" (1).

In a general way I had begun in 1929 to present this view to several chiefs of medical services in Philadelphia hospitals, but not until the fall of 1935 did an opportunity arise to actually implement a teaching program of Drug Therapy to interns in a local hospital. Under the sponsorship of Dr. Truman G. Schnabel who was then Associate Professor of Medicine at the medical school, University of Pennsylvania and head of intern training at the Philadelphia General Hospital I was given an opportunity to arrange a lecture series in Applied Drug Therapy to the interns of that hospital. This series was given jointly by myself and several top-level members of the hospital medical staff. The details of this lecture series are described in the aforementioned paper.

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* Read before the Section on Education and Legislation, Centennial Meeting, A. Ph. A., August, 1952.

** Visiting Lecturer, Graduate School of Medicine, University of Pennsylvania; Director of Torch Laboratories, Philadelphia, Pa.

After five years of lecturing at this hospital an opportunity presented itself to develop a series of lectures at the Graduate School of Medicine, University of Pennsylvania, Department of Otolaryngology. The objective of the Graduate School of Medicine, as stated in the School Bulletin is "to provide organized and adequate opportunities for physicians who are preparing themselves for medical specialization, this to include all aspects which are feasible and possible under the environment and within the facilities of the School."

Dr. George Morrison Coates who was then professor of Otolaryngology at the school sponsored the program. While the lectures at the General Hospital were given jointly by myself and members of the medical staff, the lecture course at the Graduate School was entirely my own responsibility and continues to be so to this time. The course consists of nine one-hour lecture-demonstrations of drugs, chemicals, preparations and some sundries of particular interest to the physician-student in Otolaryngology. The Materia Medica is described and students are advised how to most effectively employ and dispense the drugs from a pharmaceutical standpoint. The Graduate School of Medicine Bulletin describing the studies in the Department of Otolaryngology gives the following description of the course:—

MATERIA MEDICA AND APPLIED THERAPEUTICS

Aaron Lichtin, Ph. G. Graduate Hospital. 9 hours. Lectures.

1. Review of the general art of drug prescribing and prescription writing.
2. Discussion of the following topics: a. narcotic drugs; b. preparation of solutions for office use; c. prescribing shrinking solutions; d. official nasal preparations; e. ointments for nasal use; f. osmotherapeutic preparations; g. silver preparations; h. iodine preparations; i. ear, throat, larynx, and mouth preparations; j. abortives and prophylactics; k. local anesthetics; l. hemostatics; m. systemic medication; n. vitamins; o. chemo-therapeutic agents; p. antibiotics; q. vaccines; r. management of some emergencies; s. prescriptions; t. vehicles for internal medications.

The lectures are given on a weekly schedule during the second semester of the diaactic year. New products of the research labora-

tory are not included in the discussions; only such drugs and preparations are considered which have established themselves in clinical practice. Through the twelve years that the course has been given, it has steadily gained in recognition by both physician-students and the teaching staff members. Final examination in this subject had not become mandatory, however, until this year (1952). From time to time the subject matter is revised to conform with changes in clinical practice, by consulting some of the clinical teachers.

In 1951 I was invited by Dr. Herman Beerman to give a course of six one-hour lecture-demonstrations in medication technic to the physician-students in his department. The following titles were included in the lectures:

1. Introduction: prescription writing
2. Lotions
3. Emulsions
4. Emulsions continued
5. Ointments
6. Powders

Final examination in this subject became mandatory at once. Forecasting is a risky undertaking, but if the past is any indication at all of what the future holds for us, it would seem justifiable to express the hope that the teaching of Medication Technic at the Graduate School of Medicine, University of Pennsylvania is destined for more and more recognition in the curriculum as time goes on.

## REFERENCE

(1) The Medical Intern and Drug Therapy. *J. A. Ph. A.* 27:707:1938.

# SELECTED ABSTRACTS

**The Aromatic Diamidines in the Treatment of Systemic Fungal Disease.** Schoenbach, E. B. *Trans. N. Y. Acad. Sci. 14:272* (1952). Aromatic diamidines, particularly represented by stilbamidine (4,4'stilbenedicarboxamidine), propamidine (p,p'-(trimethylenedioxy)dibenzamidine), pentamidine (p,p'-(pentamethylenedioxy)dibenzamidine), and phenamidine (p,p'-oxydibenzamidine), have been shown to be effective against trypanosomal and leishmanial infections and also to have antibacterial and antifungal properties. The effectiveness of the newer antibiotics has discouraged extensive antibacterial trials of these compounds, but the lack of therapeutic agents effective against systemic fungal infections has led to a study of these diamidines in such diseases.

It was found that the diamidines were more effective in the higher pH ranges, but that phospholipids and nucleic acids neutralized their antifungal properties. *In vitro* studies showed that as little as 1 to 4 micrograms of the diamidines per cc. of medium prevented the growth of pathogenic fungi such as *Achorion schoenlenii, B. dermatitidis, Sporotrichum schenckii,* and *T. sulfureum.* A concentration of 100 micrograms per cc. was fungicidal against *Histoplasma capsulatum.*

The highly fatal systemic disease, North American blastomycosis, responded favorably in 4 patients who received stilbamidine. In addition the local lesions of the disease were treated with a 0.1 per cent solution of propamidine. In order to remove the fibrin and desoxyribonucleic acid contained in the exudate from the local lesions streptodornase and streptokinase were employed prior to the propamidine solution. However, a stilbamidine neuropathy appeared in 3 of these 4 patients 1 to 4 months after the completion of treatment in which 2.2 to 6 Gms. had been given. Other favorable responses of this disease to stilbamidine were referred to.

The author concluded that the favorable response of patients with North American blastomycosis and the *in vitro* antifungal effects of the aromatic diamidines on several pathogenic fungi warranted further study of these compounds in the therapy of systemic fungal diseases.

**Massive Parenteral Doses of Vitamin $B_{12}$ in the Treatment of Pernicious Anemia.** Reisner, E. H., Jr., and Weiner, L. *Bull. N. Y. Academy Med. 28*:539 (1952). Fourteen patients with pernicious anemia in relapse were treated by weekly single injections of 1000 micrograms of vitamin $B_{12}$, in the hope of being able to produce a prolonged remission. Nine of these patients had remissions which lasted from 3 to 7 months. Four additional patients were still in remission when last observed, after periods of from 4 to 9 months. One patient failed to show a complete remission.

Another group of 7 patients with pernicious anemia, who had been studied for several months and who were felt to be stabilized on conventional therapy, were also treated with weekly injections of 1000 micrograms of vitamin $B_{12}$. Four to 13 injections were given to these patients. However, the authors pointed out that in none of these patients was there evidence of any improvement above that which might have been expected from a continuation of conventional therapy with vitamin $B_{12}$ or with liver extract.

Urinary excretion studies on patients with pernicious anemia, who were given injections of 100 to 1000 micrograms of vitamin $B_{12}$, showed that from 51 to 98 per cent of the dose injected could be recovered from the urine during the succeeding 72 hours. This excretion of most of the massive doses was felt to be the reason for the failure of the massive doses to give longer remissions than conventional doses. The authors, therefore, concluded that parenteral doses of more than 50 micrograms of vitamin $B_{12}$ were largely wasted and of no advantage over smaller doses in the treatment of pernicious anemia.

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**Spontaneous Infections After the Administration of Cortisone and ACTH.** Antopol, W., Quittner, H., Gittler, R., Dordick, J., and Saphra, I. *Bull. N. Y. Academy Med. 28*:540 (1952). Animal experimentation had shown that mice frequently developed spontaneous infections from otherwise non-pathogenic bacteria during treatment with cortisone. Control animals were not susceptible to such infections even when placed in the same cages as the infected animals.

The authors reported the occurrence of infections in two human cases of Hodgkin's disease and in two of myeloid leukemia in persons treated with ACTH or cortisone. At autopsy both patients with

Hodgkin's disease showed extensive fungus infections, identified in one case as caused by *Aspergillus niger*. One patient with leukemia died of lobar pneumonia showing gram-positive cocci in macrophages, while the other developed *E. coli* sepsis and a duodenal ulcer containing *Monilia albicans*.

The authors pointed out that these infections could be either the result of dormant reservoirs becoming activated during therapy, or new infections by normally non-pathogenic organisms developing in hosts with exhausted defense mechanisms. Part of the mechanism of action of cortisone is a depression of antibodies with a resultant reduction in the pathologic conditions resulting from antigen-antibody reactions. However, this same mechanism also causes a reduction in the antibodies present in the human body which provide a main defense against the multiplication of microorganisms. In the absence of these protective antibodies bacteria and fungi which are normally non-pathogenic frequently multiply at a very rapid rate and produce serious infections. Thus, cortisone and ACTH may produce a deleterious effect on the host as well as a beneficial effect.

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**The Intramuscular Use of Salts of Procaine Amide.** Bellet, S., Zeeman, S. E., and Hirsh, S. A. *Am. J. Med. 13*:145 (1952). Because of the toxicity associated with the intravenous administration of procaine amide (Pronestyl), the authors attempted to evaluate the effects of the intramuscular administration of pronestyl gluconate and pronestyl hydrochloride. They employed single doses of 1.0 and 1.5 Gm. of the gluconate and 0.5 and 1.0 Gm. of the hydrochloride. The hydrochloride was also given in multiple doses to a number of subjects.

The authors found that there was little or no discomfort or local irritation following the intramuscular administration of these drugs. The absorption of the drug appeared to be quite satisfactory, for an effective serum level of 0.5 mg. per cent was attained in 5 to 30 minutes following the injection with a peak level in 15 minutes to 1 hour, after which the serum level gradually declined. This serum picture compares quite well with that obtained following oral administration of the drug. The authors stated that for the infrequent occasions when maintenance by the oral route is not practical the intramuscular injection of 0.5 to 1.0 Gm. of the hydrochloride every six hours should maintain effective serum levels. Normally the

intramuscular route would be used for the initial dose to stop the ectopic rhythm and then maintenance continued by oral administration of the drug.

The toxic effects observed by the authors were generally mild and similar to those obtained following oral therapy. No case of severe hypotension was observed, as is occasionally seen following intravenous therapy.

The authors stated that they felt that the intramuscular administration of pronestyl gluconate or pronestyl hydrochloride alleviated the arrhythmia with sufficient promptness and effectiveness and showed a reduction in side effects sufficient to make this route preferred to the intravenous route when prompt action is desired.

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**The Response of Anemia to Penicillin.** G. Foy, H., Kondi, A., Hargreaves, A., and Lowry, J. *The Lancet* 1:1221 (1952). Daily oral doses of 200,000 units of crystalline penicillin G produced a hemapoietic response in 2 patients with megaloblastic anemia, according to the report of the authors. However, two similar patients who received daily oral doses of 400,000 to 600,000 units of the antibiotic failed to show any improvement.

This phenomenon caused the authors to make several interesting statements. They stated that this phenomenon indicates that there is an optimum dose of penicillin in order to obtain a favorable response in the treatment of this disease. They felt that this effect can be explained on the basis that large doses of the antibiotic destroy not only the bacteria which compete for essential hemapoietic substances but also those bacteria synthesizing these substances. They did not feel that the response from the penicillin was due to some unknown hemapoietic factor in the penicillin, but simply to changes in the intestinal flora. In connection with these findings it was also pointed out that it is known that microflora preventing the utilization and synthesis of hemapoietic substances are produced by low protein-high carbohydrate diets.

The authors also found that, when optimum doses were employed, the results obtained following the oral administration of the antibiotic compared favorably with those obtained following intramuscular administration.

**The Use of Ethinyl Estradiol in Pregnancy.** Birnberg, C. H., Brandman, L. J., and Greenblat, B. *Am. J. Obst. & Gynec. 63*:1151 (1952). A group of 381 patients, 240 primigravidas and 141 multiparas, were given ethinyl estradiol from the time of their first visit to the clinic until the day of delivery. The dosage schedule was 0.5 mg. 3 times a day. The authors reported that there had been 72 abortions in the entire group prior to the time of this study. Only 5 abortions occurred among the patients given the ethinyl estradiol. The authors, therefore, felt that an excellent fetal salvage had been brought about in the patients having a previous history of abortion.

Toxemia of pregnancy, however, was not materially reduced by this schedule of therapy with the hormone. A total of 28 cases of toxemia occurred in this group. One of the authors employed a progressively increasing dosage schedule of the hormone in a group of 20 patients with a previous history of toxemia. The schedule involved starting with 0.5 mg. 3 times a day for the first 3 months and then increasing the daily dose by 0.5 mg. each month until 4.5 mg. was given each day at term. A significant reduction in the incidence of toxemia of pregnancy was obtained.

The only side effects from the medication were nausea and vomiting and they were mild. In only 2 cases were the symptoms sufficiently severe to require discontinuation of the medication. In both cases it was started again a week later without any recurrence of the symptoms.

Another group of 17 patients having pregnancy complicated with diabetes were treated with insulin and progessively increasing doses of ethinyl estradiol. Sixteen living full term infants were delivered normally and 1 was delivered by cesarean section.

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**The Spectrophotometric Estimation of Procaine Hydrochloride in Aqueous Solutions.** Biggs, A. I. *J. Pharm. Pharmacol. 4*:479 (1952). Although the identification and estimation of procaine hydrochloride in aqueous solution is possible by well established assay methods, the length of the procedure and the inaccuracies involved when only small quantities are available for examination stimulated the author to study the spectrophotometric characteristics of this drug in solution.

The author found that procaine hydrochloride in aqueous solution has a distinctive absorption curve with pronounced maxima at 2900Å and at 2210Å, and with minima at 2400Å and 2090Å. The extinction coefficients at 2900Å and 2210Å were 670 and 320, respectively. It was found that Beer's Law is applicable to these solutions at least between concentrations of 0.00025 and 0.002 per cent w/v.

Several samples of solutions of the drug were also studied for decomposition under different conditions of storage and of autoclaving. He found that the ampuls stored in diffused sunlight for 3 months showed a lower extinction coefficient at 2900Å than the same solution stored in a refrigerator for 3 months, and both were lower than that of the fresh solution. He also found that increased pressure of autoclaving and increased time of autoclaving gave progressively lower extinction coefficients. Comparing these extinction coefficients with the maximum extinction coefficient the author calculated the percentage of decomposition.

The author concluded that procaine hydrochloride may be identified and estimated spectroscopically in amounts as small as 0.06 mg. and that the method is both quick and reliable.

# BOOK REVIEW

**A Guide to the History of Science.** George Sarton. xviii + 316 p. cloth, $7.50. The Chronica Botanica Co., Waltham, Mass. Stechert-Hafner, Inc., New York City.

This book is at the same time scholarly, interesting, inspiring and challenging.

If ever a scholar has put into print his life's work, Dr. Sarton of the Harvard Faculty has done so in his guide to the history of science. Complete with personal preface, lectures resolved into printed words, tables, footnotes, references and chronological material, the results of the author's many years of labor in this field are placed at the disposal of the reader. And anyone who has even dabbled in such work should indeed be moved to admiration.

The reading portion of the text is quite interesting, and reveals the reason why Dr. Sarton has such demands upon his lecture time.

Inspiring, too, is this book, because the reader should be urged to put into just as orderly a fashion his own thoughts and findings in like endeavors.

Naturally, every reader will turn to the chapter and the section of his own specialization in science (and the book has 41 such divisions), or the history of science of his own country, or of his own special cultural group, and herein lies the challenge, for the author admits that the work cannot be complete. In the field of pharmacy, for instance, no mention is made in the list of histories of LaWall's "Four Thousand Years of Pharmacy", an accepted text of long standing. Nor does the author mention the American Journal of Pharmacy as the oldest continuously published journal of its type in America. The American Institute for the History of Pharmacy is omitted from the list of such organizations. These shall probably be carried in later revisions.

As a basic reference, Dr. Sarton's guide is a necessity for every historian and library, and as a thought-prodder it is helpful to anyone who likes to look back a bit to see what went before and influenced the momentous present day happenings in the various sciences.

JOHN E. KRAMER

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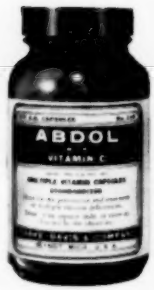


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# American Journal of Pharmacy

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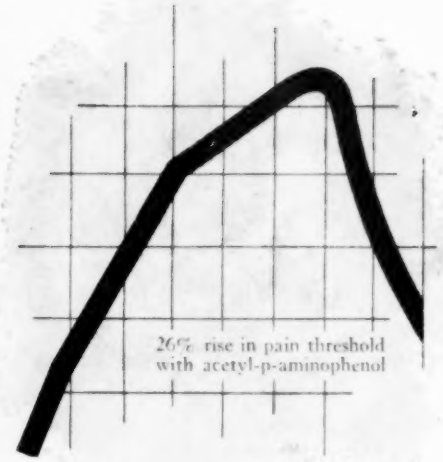


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